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ABSTRACT

Dissonance theory implies that relationships should exist between dissonance-reducing behaviors and measures of tension. It is suggested that dissonance-reducing behavior should be positively correlated across subjects with initial tension but negatively correlated with tension after dissonance-reducing behaviors have occurred. Thirty-six male and 36 female subjects were told that they would administer intense shocks, mild shocks, or tones to an undeserving victim. Heart rate and skin conductance were measured when the subject first received these instructions and while he delivered the shocks or tones. Skin conductance showed increasing arousal with increasing injury, particularly among females. Dissonance-reducing behaviors were negatively correlated with post-experimental ratings of conflict, but no relationship was found between dissonance-reducing behaviors and physiological measures. References and tables are included. (Author)

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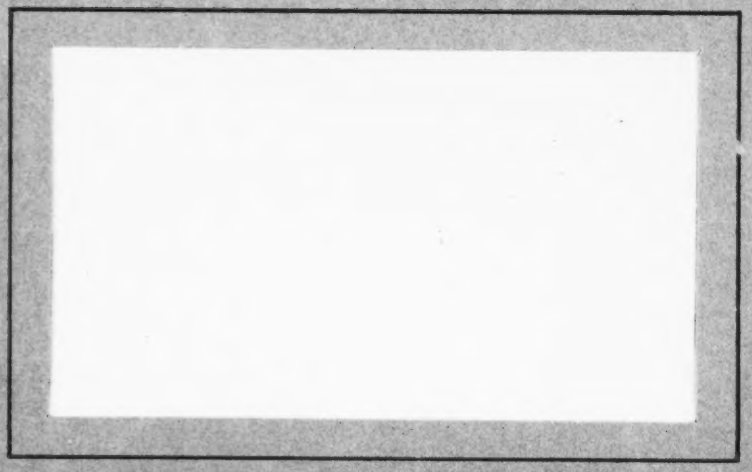

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Is dissonance motivating? Relationships between cognitive behaviors and tension measures during aggression.

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Report #73-4

Abstract

Dissonance theory implies that relationships should exist between dissonance-reducing behaviors and measures of tension. It is suggested that dissonance-reducing behavior should be positively correlated across subjects with initial tension but negatively correlated with tension after dissonance-reducing behaviors have occurred. 36 male and 36 female subjects were told that they would administer intense shocks, mild shocks, or tones to an undeserving victim. Heart rate and skin conductance were measured when the subject first received these instructions and while he delivered the shocks or tones. Skin conductance showed increasing arousal with increasing injury, particularly among females. Dissonance-reducing behaviors were negatively correlated with post-experimental ratings of conflict, but no relationship was found between dissonance-reducing behaviors and physiological measures.

Is dissonance motivating?
Relationships between cognitive behaviors and tension measures during aggression.[1]

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Cognitive consistency theories assume that the presence of inconsistency among cognitive elements is associated with an aversive drive-like state. Festinger's (1957) theory of cognitive dissonance, for example, states that dissonance between cognitive elements is accompanied by the experience of an unpleasant state of tension. This tension should be reduced if one of the cognitive elements is changed in the direction of consonance.

Although this unpleasant tension state is central to dissonance theory, it has only recently been studied directly. In the past, most studies inferred the presence of dissonance by experimentally eliminating all but one or two cognitive adjustments which could reduce dissonance and observing whether the remaining cognitive adjustments occurred. However, there is no independent measure of the intervening tension state in this kind of paradigm (Singer, 1966). This lack of independent verification brought the whole area of dissonance research into question on motivational grounds. Bem (1967; 1968) argued that the attitude statements that were the dependent variables in most dissonance studies may have been influenced by the subject's perception of his own behavior, and that the postulated drive toward consistency was not necessary to explain the results.

This problem has been addressed by recent experiments that have

attempted to measure the intervening tension state directly. A number of studies have shown that situations involving dissonance have arousing or energizing effects on performance that are similar to those of noncognitive drives (Cottrell and Wack, 1967; Pallack, 1970; Pallack and Pittman, 1972; Waterman, 1969). Other studies have shown that dissonant situations lead to arousal on certain physiological indices (Cronkhite, 1966; Gerard, 1967; 1968; Ward and Carlson, 1964). Taken as a whole, these results seem consistent with the assumption that an aversive tension state may be associated with cognitive dissonance.

Possible relationships between these tension states and dissonance-reducing cognitive behaviors have not yet been experimentally investigated. Dissonance theory implies that there should be relationships between tension and dissonance-reducing behavior. In particular, one could argue that dissonance-reducing behavior should be positively correlated across subjects with initial tension, but negatively correlated with measures of tension taken after cognitive adjustments have taken place. According to the theory, the function of dissonance-reducing behavior is to reduce an aversive state of tension. This suggests that when a person is placed in a situation involving cognitive inconsistency, he should show an initial state of tension which will be positively related to later dissonance-reducing behavior--the more tension, the more behavior. However, one might expect that dissonance-reducing cognitive adjustments would begin to occur fairly quickly in some individuals, while other persons may not engage in dissonance-reducing behaviors. These dissonance-reducing behaviors should function to lower tension for the former individuals while the latter persons should remain comparatively aroused. The more a person engages in

dissonance-reducing behavior, the less tension he should eventually manifest. This should result in a negative correlation across subjects between dissonance-reducing behavior and later tension measures.[2]

Suggestive results showing a negative correlation between dissonance-reducing behaviors and tension measures have been found previously. Cronkhite (1966), using sking conductance lability as a measure of tension, expected to find a positive relationship between tension and an attitude-change measure of dissonance-reducing behavior. Instead, he found a negative relationship, perhaps becuase his tension measure was taken after the cognitive adjustments had occurred. In an unpublished experiment, Buck and Allen (1968) studied subjects who were led to believe that they were giving shocks to another person. Two cognitive behaviors that could potentially reduce post-aggression dissonance--devaluing the other and minimizing the painfulness of the shock--were found to be negatively correlated with tension ratings, particularly in the intense shock conditions. That result led to the design of the present experiment.

It is well known that subjects may obey an experimenter and administer apparently painful shocks to another even while showing signs of intensely unpleasant arousal (Milgram, 1965). The present study obtained a continuous physiological measure of the tension associated with delivering painful shocks to an underserving victim. Subjects were led to believe that they were giving intense shocks, mild shocks, or harmless tone signals to a partner. The heart rate and skin conductance responses associated with hearing the initial instructions, and later with actually delivering the shock or tones, were monitored. It was therefore hypothesized that dissonance-reducing behavior would

be positively correlated with the physiological response to the initial instructions and negatively correlated with the response to delivering the shocks or tones.

The physiological measures, as well as a self-report measure of conflict over giving the shocks, were related to a variety of potential dissonance-reducing behaviors. The act of injuring an undeserving victim is said to cause post-aggression cognitive dissonance because the cognition that one has injured the victim is not compatible with the cognition that the victim did not deserve the abuse (Brock and Pallak, 1969). There are a number of cognitive adjustments that might reduce this dissonance. These include (a) minimizing the painfulness of the shock, (b) emphasizing the importance of experimentation and the justifiability of the use of shock, (c) denying the suffering of the victim, and (d) devaluing the victim. All of these cognitive adjustments were assessed in questionnaires, and their relationships with tension measures were investigated.

Method

Subjects

Subjects were 36 male and 36 female undergraduates enrolled in the introductory psychology course at the University of Pittsburgh. They received points worth extra credit toward their course grade for participation in the experiment. One additional male in the intense shock condition was dropped from the sample because he refused to administer shocks.

Design and Apparatus

Two subjects of the same sex were run at the same time in different

rooms, each thinking that he was delivering shocks or tones to the other. The independent variable of Shock Intensity (Intense Shock vs. Mild Shock vs. No Shock) was established and subjects were blocked by sex (Male vs. Female). Assignment of subjects to the two rooms was balanced so that the effects of any procedural differences between the rooms could be evaluated by an additional two level factor (Room 1 vs. Room 2). The 72 subjects were divided evenly among the conditions of the resulting 3X2X2 design.

The polygraph and programming apparatus were in a control room that was shown briefly to the subjects as they entered the laboratory. Physiological responses were monitored by an eight-channel Grass Model 7 polygraph equipped with two 7P1A preamplifiers for skin conductance (SC) measurement and two 7P5A preamplifiers for heart rate (HR) measurement. Zinc electrodes with zinc sulfate electrode paste were used to monitor SC (Lykken, 1959). These were placed in a unipolar arrangement with the active electrode on the volar surface of the distal phalange of the second finger of the left hand. The indifferent electrode was placed on the left forearm after the site had been pretreated by being rubbed vigorously with a facial tissue containing electrode paste. Standard electrocardiogram electrodes, strapped to the underside of each wrist, were used to monitor HR.

Procedure

Two subjects were scheduled for each experimental session. When they arrived they were told that the experiment was concerned with the voluntary control of normally automatic physiological processes, and that two subjects were being run at once in order to control for extraneous factors affecting physiological responding, such as the time of day, temperature, and humidity.

The subjects were asked to read and sign a consent form which stated in part that the subject could terminate the experiment at any time if he so desired. The experimenter emphasized this point, saying that the subjects would not be required to do anything against their will.

Heart rate and SC electrodes were then attached, and the two subjects were separated. Each was taken to a room containing a comfortable chair, the electrodes were plugged in, and the subject was asked to fill out a scale giving his first impression of the other subject. The experimenter explained that another psychologist needed some reliability data on the scale.

After waiting 15 minutes for physiological responses to stabilize, the experimenter informed both subjects that he would contact them over a loudspeaker to give them their first instructions. After 60 seconds had passed, a baseline sample of physiological responding was taken, after which a tape recording informed both subjects that their physiological response to a tone would be measured. A series of 16 tones of 1.75 sec. duration was then presented by a Mallory Sonalert mounted on a table beside the subjects. The tones sounded at intervals of 15, 20, 25 and 30 seconds, with the sequence determined by a randomly selected 4 X 4 latin square and timed by a Foringer tape drive.

After the tones were presented, another tape recording informed the subjects that the other subject was being set up for the next part and that the experimenter would call again over the loudspeaker for the next phase. After two minutes had passed, the following instructions were presented (alterations for the Mild Shock and No Shock conditions are given in parentheses. Asterisks denote points where physiological responses were measured):

As I said, the reason that you and the other subject are run at the same time is to give us control over extraneous variables such as time of day, temperature, and humidity...

I'll monitor your baseline physiological measures to control for these factors, and particularly for the slow recovery of the skin conductance from what it was like outside... Your partner has been randomly chosen to be the experimental subject. We are interested in seeing the extent to which people can control their normally automatic physiological responding. To do this, I want to (shock the other subject) (present a tone to the other subject)*for feedback when certain kinds of physiological responses occur. Since you're in the control group, you won't (receive any shock at any time) (have this tone paired with any physiological responses that you make). Instead, as a control procedure, the same tone that sounded before will sound in your room whenever the other subject's (shock) (tone) is presented.

I'll need your help in actually delivering the feedback.* Your partner and I must sit side by side watching the physiological record to see when the kind of physiological responses occur that I want to associate with the (shock) (tone). Since I'm sitting nearby, if I make any physical move to push a button, we've found that the other subject can sense it, and this disrupts the physiological response prematurely. To get around this problem, I'd like you to (administer the shock) (give the tone). We have a thoat microphone hooked up so that I can say 'uh huh' into it without the other subject knowing exactly when I'm doing it. The other subject is wearing earphones and can't hear me, and I don't move my lips. So, when I see the critical physiological response. I'll say 'uh huh' into the make, and you (deliver the shock) (sound the tone) by pressing on the key on your right.

The following instructions established the manipulation of Intense vs. Mild Shock and were not given in the No Shock condition:

As to the shock itself, the shock has to be quite (intense and painful) (mild and painless).* We have found that people have a similar reaction to shock only when it is very (painful) (painless) to them. Of course it is quite safe and cannot do any permanent damage.

The last instructions were given to all subjects:

I want to emphasize that it's our policy to give subjects full choice* in participating in these experiments.

> You're under no obligation to continue with the remainder of the study if you don't want to. You can leave if you want to; some students have preferred not to get involved in this next part and have left. In other words, its entirely up to you whether or not you stay and give the (shocks) (tones). I'll be over in a minute and I'll make sure you want to continue.*

After the instructions were delivered, the experimenter went to both rooms to attach an inductorium and batteries to a telegraph key mounted beside the subject and to a red box from which a wire led out of the room. The box was labeled "Caution, Shock Electrodes" in the Shock conditions and "Room 2, Tone Generator" in the No Shock group. The inductorium, batteries, and box had been concealed up to that time. The experimenter explained their presence by saying that the equipment was more reliable if kept in the same room with the key.

The experimenter then returned to the control room and turned on tape recorded instructions in both rooms which said:

> "Okay, we're ready to start now. Remember, every time I say 'uh huh,' you press the key on the table."

The voice on the tape then said "uh huh" 16 times, following the same time sequence as that by which the tones had been presented previously. When the subject pushed the key, it activated that same tone. It also activated the inductorium, which made a buzzing sound. At the end of the series, the voice on the tape said "Okay, you can stop now. Don't push the key anymore. I'll be over in a minute."

The experimenter then went to both rooms, took off the subject's electrodes, and gave the first-impression rating scale again, explaining that the test-retest reliability of the scale was being assessed. He also gave a post-experimental questionnaire. After these were completed, the subjects were brought together and the experiment was explained in detail.

The experimenter allayed any anxiety the subjects had about possibly injuring the other by pointing out that the subject had been told that the other could leave the experiment at any time if he so desired.

Quantification of the Dependent Variables

Arousal Measures. The measures of the physiological response to the initial prospect of injuring the other was made by examining the response to the tape recorded instructions that established the Shock Intensity manipulation. Asterisks in the above instructions indicate points where the responses were measured. At each point and also at a point 15 seconds before the instructions began, the following measures were taken; the rate of the first ten heartbeats (in beats per minute), the number of SC responses over 500 ohms within 15 second, and the highest SC level within 15 seconds (in log microhmos x 10).

The later physiological measure of tension was taken by examining the responses to the tones. The HR response to each tone was maeasured by examining the rate (in beats per minute) of the three heartbeats immediately preceding the tone and the rate of the first three, second three, and third three beats following the tone. The SC response was calculated as the size (in log microhmos) of the largest single SC change within five seconds of the onset of the tone.

The subject's response to the first series of tones, when the tones were not associated with injuring anyone, was compared with that same subject's response to the same tones when they were associated with various levels of injury. The mean difference D between the subject's response to the 16 baseline tones and the 16 tones associated with injuring tho other was taken for both HR and SC:

$$\underline{D} = \frac{(\Sigma \text{ response to injury tones} - \Sigma \text{ response to baseline tones})}{\# \text{ Trials}}$$

Each subject's response to delivering injury to the other was thus corrected by his response to comparable baseline tones. This should control for individual response specificity, the tendency of an individual to react different events with the same pattern of physiological responding (Lacey, 1950).

The self-report measure of tension was the subject's postexperimental rating, on a 10-point scale, of the amount of unpleasant conflict he felt when he administered the shocks.

Dissonance-Reducing Behaviors. The following were taken as measures of cognitive behaviors that could potentially reduce post-aggression dissonance. All were taken after the experiment on 10-point rating scales unless otherwise indicated.

1. Minimizing the painfulness of the shock was measured by three questions. One asked how painful the subject imagined the shocks were, another asked how afraid the subject himself was of taking electric shocks, and the third asked how unpleasant the subject would feel if he had to take a series of shocks.

2. Emphasizing the importante of the experiment was measured by the difference in the subject's rating of the usefulness and importance of psychological experiments before the experiment and his similar rating of the present study after the experiment. The subject also rated whether he thought the use of shocks in psychological experiments is justified by the gain in scientific knowledge.

3. Denying the suffering of the victim was measured by three questions. One asked how much the subject thought about the victim's possible suffering, a second asked how much he actively had to avoid thinking about the victim's suffering, and a third asked whether the victim's suffering was important to the subject.

4. Devaluing the victim was measured by the unfavorable change (in mm) between the subject's preexperimental and postexperimental ratings of the victim along 100mm lines defined by the bipolar adjectives "unpleasant personality-pleasant personality," "cold person-warm person," "bad person-good person," and "dirty-clean."

Results

Effectiveness of the Experimental Manipulations.

The shock groups rated the intensity of the shock they thought that they had given the victim along a 10-point scale. The results appear in Table 1. Intense shock subjects rated the shock as more intense

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than did Mild Shock subjects ($F_{1,40} = 32.23$, $p < .001$). To insure that the subjects perceived that they had choice in delivering the shocks, the Shock groups rated on a 10-point scale how much pressure they thought had been applied so that they would go along with the experimenter's wishes. As Table 1 shows, the ratings were low, indicating that they felt relatively little pressure to give the shocks.

Measures of Tension.

Initial Physiological Response to the Instructions. Heart rate and

SC responding at five points during the tape-recorded instructions are presented in Figure 1. They were analyzed as change scores from the

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comparable response in the initial period immediately preceding the instructions. The correlations between these change scores and baseline physiological responding taken at the beginning of the experiment were low and nonsignificant, so a covariance analysis was judged to be unnecessary.

It was expected that the physiological measures would show a greater increase in arousal in the two Shock groups than in the No Shock group following the mention of shocks vs. the mention of tones. This result approached significance only among the female subjects. Females in the Shock group showed a larger increase in arousal than females in the No Shock group in heart rate responding (t = 1.79, df = 34, p <.05), in the number of SC responses (t = 1.45, df = 34, p <.10) and in SC level (t = 1.54, df = 34, p <.10). The results for males were in the predicted direction, but they did not approach significance.

It was expected that, after the instructions about shock intensity, the Intense Shock group would show the largest overall increase in arousal and the No Shock group would show the smallest. This expectation was fulfilled with the SC measures. Both the number of SC responses and SC level rose in the two shock groups until the intensity instructions, after which the Mild Shock group fell and the Intense Shock group continued to increase. After the instructions reemphasizing the subject's freedom of choice in giving the shocks, analyses of variance revealed significant linear trends across shock intensities, indicating that the Intense Shock group showed the greatest arousal increase and the No Shock group

the smallest on both the number of SC responses ($F_{1,60}$= 7.99, p <.01) and in SC level ($F_{1.60}$=3.52, p <.07).

The results with the heart rate measure were less consistent, with little differential change in response while the instructions were on. Interestingly, after the instructions were over, the heart rate of the Intense Shock group accelerated and the expected pattern of large arousal increase in the intense Shock group and small increase in the No Shock group was revealed, albeit at a marginal level of significance ($F_{1,60}$= 3.46, p<.07).

Later Physiological Measure. The later measure of the physiological response to injuring the other was D, which reflected the change between the subject's baseline response to the tones and his later response to the same tones when they were associated with delivering shocks or tones to the other. The results for the HR and SC measures of D are given in Table 2. An analysis of variance of the SC measure showed a significant

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linear trend across shock intensities ($F_{1,60}$= 5.51, p <.025). This indicated that, as expected, subjects in the Intense Shock conditions showed the greatest increase in the size of their SC response and subjects in the No Shock conditions showed the smallest. Further analysis revealed that this result was due primarily to the female subjects. Females in the Intense Shock condition had significantly larger increases in the size of the SC response than did females in the No Shock group (t = 2.36, df = 22, p < .05). This comparison for males, while in the same direction, was not significant. Also, females in the shock groups had marginally larger SC changes than did the males (t = 1.41, df = 46, p < .10).

As Table 2 shows, the trends for the HR measure of D were generally similar to those of the SC measure, but error variance was high and an analysis of variance revealed no significant effects. Inspection of the HR responses revealed a possible reason for the high error variance. The baseline tones led to HR deceleration (Sign Test, $p < .02$), while the tones associated with giving shock or tones led to HR acceleration (Sign Test, $p < .05$). This unexpected effect throws the logical basis of the HR measure of D into question, and it probably contributed to the high error variance.

If the SC measure of D was, in fact, responding to a state of tension associated with injuring the other, it should be related to other physiological measures of this tension, but only in those conditions where the measures are responding to a common factor, i.e. only when the other was being injured. In particular, the SC measure of D should be positively correlated with the SC response to the instructions in the Intense and Mild Shock conditions, but not in the No Shock condition. The correlations between these measures, presented in Table 3, indicate that this was indeed the case. The SC measure of D was significantly correlated

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with the other SC measures in the Intense and Mild Shock conditions, but not the No Shock condition, and the correlations in the two Shock conditions were significantly different ($p < .05$) from those in the No Shock condition.

Self-Report Measures. Self-reported tension was measured by the rating on a ten-point scale of the amount of unpleasant conflict the subject felt when he delivered the shocks. As Table 2 indicates, females

rated themselves as feeling more conflict than did males ($F_{1,40} = 16.65$, $p < .001$). There were no other significant effects.

Sex Differences.

Although this experiment was not specifically designed to analyze sex differences in the response to injuring another person, some differences emerged that were interesting despite their being difficult to interpret with the present experimental design. We have seen evidence that women showed greater tension about giving the shocks than did men. The physiological response to injuring the other was slightly but consistently larger among females than males. Women had significant HR and SC response to the initial shock instructions and men did not, and the SC D measure of the response to injuring the other was higher among women than men. Also, females rated thenselves as feeling more conflict about giving the shocks than did men.

Women also had less tendency than men to engage in certain potentially dissonance-reducing behaviors. Women rated that they would feel more unpleasant if they had to undergo a series of shocks ($F_{1,60}=5.92$, $p < .025$), they thought that the use of shocks in experiments is less justifiable ($F_{1,60}=5.44$, $p < .025$), and they reported thinking more about the suffering of the victim ($F_{1,40}= 5.33$, $p < .05$) and having to avoid thinking about the victim's suffering more ($F_{1,40}= 5.65$, $p < .025$), and they felt the victim's suffering was more important ($F_{1,40}= 5.79$, $p < .025$) than did men.

Relationships Between Tension Measures and Potential Dissonance-Reducing Behaviors.

The distributions of the potential dissonance-reducing behaviors in

each condition were examined before being correlated with tension measures. A few were moderately skewed, but most were symmetrical and virtually all showed a wide range.

The product-moment correlations between the potential dissonance-reducing behaviors and self-reported tension are shown in Table 4. As expected, several of the behaviors were negatively correlated with

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rated conflict over giving the shocks. This was particularly true of minimizing the painfulness of the shock and denying the suffering of the victim. Devaluing the victim was not significantly correlated with rated conflict. Further analysis revealed that none of the potential dissonance-reducing behaviors was correlated in any systematic way with the physiological measures of tension. Neither the SC or HR response to the instructions nor the SC or HR D measures of tension was systematically correlated with any of the behaviors.

Discussion

Physiological Measures.

Skin conductance responding was affected by the experimental manipulations as expected. Both the initial prospect and the act of injuring the other led to arousal proportional to the injury. Also, the SC response to the instructions and the act were positively correlated in the Shock conditions but not the No Shock condition. If this correlation had existed in the No Shock condition it could have been attributed to individual response specificity, but since it did not it can reasonably be attributed to the presence of tension over injuring the other. The SC responses thus seemed to provide a consistent measure

of at least one aspect of the tension involved in giving shocks to another person.

Heart rate, in contrast, did not respond as expected to the initial instructions. Also, the HR response to the tones was unexpectedly complex, with the baseline tones leading to accelerations and the tones associated with stimulating the other evoking accelerations. Actually, this effect is quite consistent with Elliott's (1969) observation that a passive reception of a stimulus is associated with HR deceleration while acceleration occurs when a response requirement exists. The subject was passive when the baseline tones were presented, and the later tones were associated with the active response of pressing the key to deliver shock or tones to the other. Also consistent with Elliott, the response requirement appeared to affect HR responding much more than it affected SC.

Sex Differences.

Females were found to show greater physiological and self-reported tension about injuring the other than males, and females had less tendency to engage in certain of the potential dissonance-reducing behaviors. These findings are suggestive, but difficult to interpret in the present study because of the subjects always thought they were shocking a person of their own sex, and the results could thus have been affected by the sex of the victim. Further study is required using all combinations of male and female pairings to determine whether these differences were due to the sex of the subject, the victim, or both.

Relationships Between Dissonance-Reducing Behaviors and Tension Measures.

This study found that SC arousal increased with manipulations designed to increase dissonance. Other evidence that situations involving cognitive dissonance are accompanied by drive-like states has been interpreted as indicating, contrary to Bem's (1967; 1968) self-perception hypothesis, that dissonance-reducing behavior is motivated by such a state. However, if this is true, there should be relationships between this state and dissonance-reducing behaviors. This experiment failed to demonstrate such relationships using HR and SC indices of the drive-like state of tension. Of course, this does not indicate that such relationships do not exist. They might be found using a different experimental design or different measures of tension. However, until such relationships are demonstrated, the presumed causal relationship between the drive-like state and the dissonance-reducing behaviors is open to question.

This experiment replicated the finding by Buck and Allen (1968) that rated conflict is negatively correlated with the minimization of the painfulness of the shock, and it found further that perceiving the shock as justified and denying the suffering of the victim was also negatively correlated with rated conflict. However, the earlier finding that devaluation of the victim was negatively correlated with conflict ratings was not repeated.

It might be noted that the finding that dissonance-reducing behaviors were negatively correlated with self-reported tension is not inconsistent with Bem's self-perception hypothesis. Bem argued that the self-descriptive statements which are the major dependent

variables in most dissonance experiments are based upon an individual's observations of his own overt behavior and the external stimulus situation, rather than an aversive drive-like state. The dissonance-reducing behaviors and the self-reported conflict in this experiment are self-descriptive statements. It is quite possible that the same perceptions of his overt behavior and situational stimuli that cause a subject to say that he had great conflict over giving the shock might also cause him to say that the shock was painful and unjustified and that he thought a lot about the victim's suffering.

This experiment found that a dissonance manipulation produced physiological arousal, but it failed to support hypotheses derived from dissonance theory that relationships would exist between this arousal and dissonance-reducing behaviors. Such relationships were found with self-reported conflict, but these could be explained by Bem's hypothesis. It is possible that the occurrence of dissonance-reducing behavior may be determined primarily by processes involving self-perception, as Bem suggests, while at the same time situations involving high dissonance may often cause drive-like states of arousal which are relatively independent of dissonance-reducing behavior.

References

Bem, D. J. Self perception: An alternative interpretation of cognitive dissonance phenomena. Psychological Review, 1967, 74, 183-200.

Brock, T. C. & Pallack, M.S. The consequences of choosing to be aggressive: An analysis of the dissonance model and review of relevant research. In P. G. Zimbardo (Ed.), The cognitive control of motivation. Chicago: Scott, Foresman, 1969.

Buck, R. W. & Allen, V. L. Dissonance-reducing behavior and tension reduction following aggression. Unpublished paper, University of Wisconsin, 1968.

Cottrell, N.B. & Wack, D.L. The energizing effect of cognitive dissonance on dominant and subordinate responses. Journal of Personality and Social Psychology, 1967, 6, 132-138.

Cronkhite, G. Autonomic correlates of dissonance and attitude change. Speech Monographs, 1966, 33, 392-399.

Elliott, R. Tonic heart rate. Journal of Personality and Social Psychology, 1969, 12, 211-228.

Festinger, L. A. A theory of cognitive dissonance. Stanford: Stanford University Press, 1957.

Gerard, H. B. Choice difficulty, dissonance, and the decision sequence. Journal of Personality, 1967, 35, 91-108.

Lacey, J. I. Individual differences in somatic response patterns. Journal of Comparative and Physiological Psychology, 1950, 43, 338-350.

Lykken, D. T. Properties of electrodes used in electrodermal measurement. Journal of Comparative and Physiological Psychology, 1959, 52, 629-634.

Pallak, M. S. The effects of expected shock and relevant or irrelevant dissonance on incidental retention. Journal of Personality and Social Psychology, 1970, 14, 271.

Pallak, M. S. & Pittman, T. S. General motivational effects of dissonance arousal. Journal of Personality and Social Psychology, 1972, 21 (3), 349-358.

Singer, J. E. Motivation for consistency: In S. Feldman (Ed.), Cognitive consistency: Motivational antecedents and behavioral consequents. New York: Academic Press, 1966.

Waterman, C. K. The facilitating and interfering effects of cognitive dissonance on simple and complex paired-associate learning tasks. Journal of Experimental Social Psychology, 1969, 5, 31-42.

Ward, W. D., & Carlson, W. A. Cognitive dissonance, opinion change, and physiological arousal. Journal of General Psychology, 1964, 71, 115-124

Footnotes

1. This study is based on a doctoral dissertation submitted to the Department of Psychology of the University of Pittsburgh. The author wishes to thank Drs. Robert E. Miller, Richard Willis, and Joel W. Goldstein for their assistance and advice. Requests for reprints should be sent to Ross Buck, Department of Psychology, Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213.

2. This would only apply in situations where there are relatively wide individual differences in the tendency to engage in dissonance-reducing behavior. If a strong enough tendency to either use or refrain from using a particular dissonance-reducing behavior existed within a group of subjects, the range on the variables would be restricted and the correlation would therefore be low (McNemar, 1959).

Table 1. Mean values for rating scales dealing with perceived shock intensity and freedom of choice.

Measure	Sex	Intense Shock	Mild Shock
High = Shocks were intense	Female	5.25	3.08
	Male	7.00	2.08
High = Pressured to give shocks	Female	2.08	1.58
	Male	1.33	1.58

Table 2. Mean values for the later physiological and self-report measures of tension.

Measure	Sex	Intense Shock	Mild Shock	No Shock
SC D	Female	+1.15	+0.83	+0.28
	Male	+0.79	+0.30	+0.40
HR D	Female	+3.29	+2.55	+1.89
	Male	+1.34	+1.14	+1.16
Rated Conflict	Female	6.25	4.75	-
	Male	3.00	2.50	-

Table 3. Correlations between the skin conductance measure of D and the skin conductance response to the initial instructions.

Condition	Change in number of SCRs. Preinstruction to emphasis of choice	Change in SC level. Preinstruction to emphasis of choice
Intense Shock	+.53**	+.47*
Mild Shock	+.41*	+.62**
No Shock	-.15	-.05

* $p < .05$
** $p < .01$

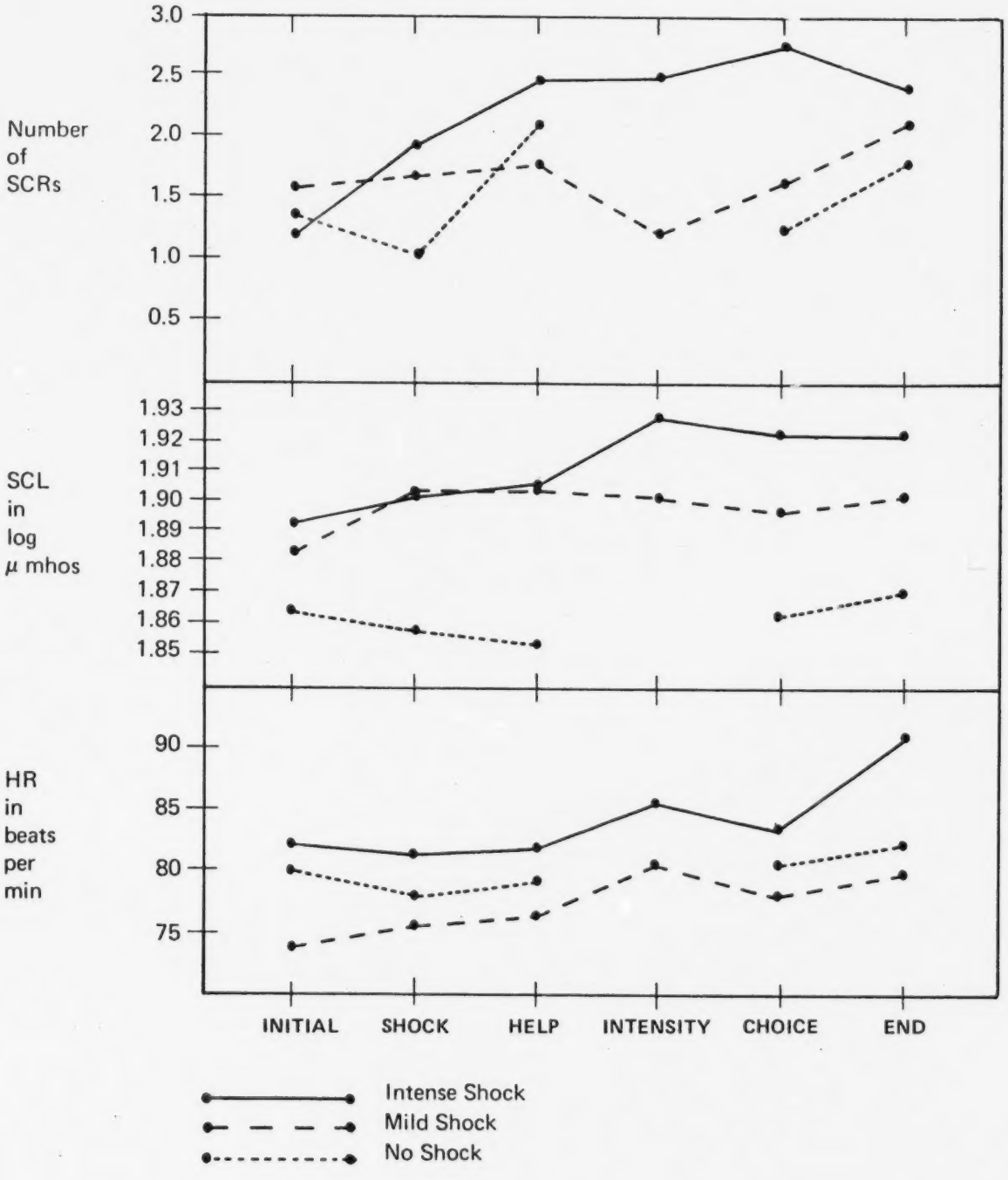
Table 4. Correlations between potential dissonance-reducing behavior and rated conflict

Potential Dissonance-Reducing Behavior	Females		Males		Average r
	Intense	Mild	Intense	Mild	
Minimization of Pain					
1. The shock was not painful.	-74	-40	-25	-72	-56 p <.001
2. I'm not afraid of shock.	-22	-28	+33	-05	-06 NS
3. I'd not feel unpleasant	-18	-69	-14	-24	-34 p <.05
Average	-42 p<.05	-48 p<.01	-.02 NS	-38 p<.05	
Emphasizing the Importance of the Experiment					
4. The experiment is important.	-12	+38	-34	+08	-01 NS
5. The use of shock justified.	+09	-54	-18	-67	-36 p<.01
Average	-02 NS	-10 NS	-26 NS	-35 NS	
Denying the Suffering of the Victim					
6. Didn't think about suffering	-72	-87	-24	-65	-65 p<.001
7. Didn't need to avoid thinking.	-52	-80	-31	-67	-61 p<.001
8. His suffering wasn't important	-79	-53	-31	-30	-50 p<.001
Average	-69 p<.001	-76 p<.001	-29 NS	-56 p<.005	
Devaluing the Victim					
9. The victim is unpleasant.	+20	-21	-03	-43	-12 NS
10. The victim is a cold person.	-04	+11	+34	-47	-02 NS
11. The victim is a bad person.	-28	-50	+36	-18	-16 NS
12. The victim is dirty.	-04	+08	-55	-38	-24 NS
Average	-04 NS	-14 NS	+02 NS	-37 p<.05	

Note.-Underlined correlations are significant (p<.05)

Figure Captions

Figure 1. Physiological responses to the initial instructions.


Number of SCRs
3.0
2.5
2.0
1.5
1.0
0.5
SCL in log μ mhos
1.93
1.92
1.91
1.90
1.89
1.88
1.87
1.86
1.85
HR in beats per min
90
85
80
75
INITIAL
SHOCK
HELP
INTENSITY
CHOICE
END
Intense Shock
Mild Shock
No Shock